DigitalCommons @WayneState

Journal of Modern Applied Statistical Methods

Volume 15 | Issue 1 Article 45

5-1-2016

JMASM38: Confidence Intervals for Kendall's Tau with Small Samples (SPSS)

David A. Walker
Northern Illinois University, dawalker@niu.edu

Recommended Citation

Walker, David A. (2016) "JMASM38: Confidence Intervals for Kendall's Tau with Small Samples (SPSS)," *Journal of Modern Applied Statistical Methods*: Vol. 15 : Iss. 1 , Article 45.
DOI: 10.22237/jmasm/1462077840
Available at: http://digitalcommons.wayne.edu/jmasm/vol15/iss1/45

JMASM38: Confidence Intervals for Kendall's Tau with Small Samples (SPSS)

Erratum
This paper was originally published in JMASM Algorithms & Code without its enumeration, JMASM38.

Journal of Modern Applied Statistical Methods
May 2016, Vol. 15, No. 1, 868-883.

ISSN 1538 − 9472

JMASM Algorithms and Code
Confidence Intervals for Kendall's Tau with Small Samples

David A. Walker
Northern Illinois University
DeKalb, IL

A syntax program, not readily expedient in statistical software such as SPSS, is provided for an application of confidence interval estimates with Kendall's tau-b for small samples.

Keywords: Kendall's tau, confidence intervals, SPSS, syntax

Introduction

This syntax program (Walker, 2015) is intended to provide an application, not readily available, for users in SPSS who are interested in a range of confidence interval (CI) estimates with Kendall's tau-b (τ) for small samples. Statistically, Kendall's tau-b is a non-parametric, correlational method typically employed with ordinal x and y measures. Tau's application within social science research has been predominantly in correlational meta-analysis studies and also as a component of experimental research (Cooper & Hedges, 1994; Gilpin, 1993). Furthermore, tau has been highlighted as a proxy for Pearson's product-moment correlation (r) in research situations where sample sizes are small (Rupinski & Dunlap, 1996). Tau is expressed as (Helsel & Hirsch, 1995):

$$\tau = \frac{C - D}{N(N-1)/2} \tag{1}$$

where C = number of concordant pairs, D = number of discordant pairs, and N = sample size.

Dr. Walker is a Professor of Educational Research and Assessment. Email him at: dawalker@niu.edu.

According to Bonett and Wright (2000), "interval estimation may be more appropriate in applications where the magnitude of a correlation is of primary interest" (p. 23). Certainly, there has been prominence afforded in the literature to this issue that confidence intervals need to be reported with point estimates, such as tau, to supplement and progress the interpretation of outcomes (American Psychological Association, 2010; Levin & Robinson, 2003).

Further, Long and Cliff (1997), supposing a bivariate normal population, found that tau performed reasonably well with small samples > 10 and < 25, where samples ≥ 25 could be conducted with a Pearson r correlation because of x and y's sampling from a bivariate normal distribution (Kendall, 1949). Lower and upper bound confidence intervals for tau can be represented through a series of steps such that Fisher's z-transformation is used for "normalizing the sampling distribution of τ" (Long & Cliff, 1997, p. 35). Specifically,

$$\tau_z = 0.5 \ln\left(\frac{1+\tau}{1-\tau}\right) . \tag{2}$$

Per Fieller, Hartley, and Pearson (1957), the standard error of $\tau_z[\mathrm{SE}(\tau_z)]$ is used with the desired unit normal critical value to construct the lower and upper confidence bounds for τ_z:

$$\tau_{z.\mathrm{lower}} = \tau_z - z_{1-\alpha}\,\mathrm{SE}(\tau_z) \tag{3}$$

and

$$\tau_{z.\mathrm{upper}} = \tau_z + z_{1-\alpha}\,\mathrm{SE}(\tau_z) , \tag{4}$$

where $\tau_{z.\mathrm{lower}}$ and $\tau_{z.\mathrm{upper}}$ are the lower and upper bounds, respectively; $z_{1\text{-}\alpha}$ is the unit normal critical z value for specified level of confidence $1 - \alpha$; and

$$\mathrm{SE}(\tau_z) = \sqrt{\frac{0.437}{N-4}} \tag{5}$$

The values of the previously-mentioned lower and upper confidence bounds for τ_z are then transformed (Fisher, 1925) due to tau's ability "…to generalize from the sample to the population correlation for any monotonic transformation of bivariate normal variables" (Bonett & Wright, 2000, p. 24). Specifically,

$$\tau_{\text{lower}} = \frac{\exp\left(2\tau_{\text{lower}}\right)-1}{\exp\left(2\tau_{\text{lower}}\right)+1} \tag{6}$$

and

$$\tau_{\text{upper}} = \frac{\exp\left(2\tau_{\text{upper}}\right)-1}{\exp\left(2\tau_{\text{upper}}\right)+1} \tag{7}$$

Confidence Intervals for Kendall's Tau with Small Samples Program

The independent SPSS syntax platform allows the user to merely run the program, which yields a comprehensive list of tau values ranging from 0.99 to -0.99, in increments of 0.01, for small samples extending from 11 to 24, per the Long and Cliff (1997) recommendation. The confidence intervals presented in conjunction with the tau values are programmed at 80%, 90%, 95%, and 99%, where Cohen (1990, p. 1310) observed "I don't think that we should routinely use 95% intervals: Our interests are often better served by more tolerant 80% intervals." Further, Tukey (1960) added that the application of confidence intervals was of paramount importance,

> Probably the greatest ultimate importance, among all types of statistical procedures we now know, belongs to confidence procedures which, by making interval estimates, attempt to reach as strong conclusions as are reasonable by pointing out, not single likely values, but rather whole classes (intervals, regions, etc.) of possible values, so chosen that there can be high confidence that the "true" value is somewhere among them. (p. 429)

It should be noted that this program produces an exceedingly large table (i.e., Table 1 is over 60 pages) and; therefore, only a sample of the results are shown below. The selection of results display an assortment of magnitude and directionality with tau and small samples from 11 to 24. The array of example tau values include positive, large tau ranging from 0.90 to 0.99; positive, moderate values from 0.40 to 0.50; and negative, small values extending from -0.20 to -0.10, all with accompanying CIs.

```
**********************************************************************
Copyright David A. Walker, 2015
Contact dawalker@niu.edu
Northern Illinois University, 204D Gabel, DeKalb, IL 60115
             **APA 6th Edition Citation**
Walker, D. A. (2015). Confidence intervals for Kendall's tau with small
samples [Computer
program]. DeKalb, IL: Author.
**********************************************************************.
INPUT PROGRAM.
LOOP #CASE = -99 TO 99.
LOOP #N = 11 TO 24.
COMPUTE T = #CASE*.01.
COMPUTE N = #N.
END CASE.
END LOOP.
END LOOP.
END FILE.
END INPUT PROGRAM.
EXECUTE.
SORT CASES BY
  T (D) .
SELECT IF NOT (T = .00).
COMPUTE FISHERZ = .5*LN((1+T)/(1-T)).
COMPUTE SEZ = SQRT(.437/(N-4)).
COMPUTE CRITICAL80 = ABS(IDF.NORMAL((1-.80)/2,0,1)).
COMPUTE FISHERZL80 = FISHERZ - 1.28*SEZ.
COMPUTE FISHERZU80 =  FISHERZ + 1.28*SEZ.
COMPUTE TL80 = (EXP(2*FISHERZL80) - 1)/(EXP(2*FISHERZL80) + 1).
COMPUTE TU80 = (EXP(2*FISHERZU80) - 1)/(EXP(2*FISHERZU80) + 1).
COMPUTE CRITICAL90 = ABS(IDF.NORMAL((1-.90)/2,0,1)).
COMPUTE FISHERZL90 = FISHERZ - 1.645*SEZ.
COMPUTE FISHERZU90 =  FISHERZ + 1.645*SEZ.
COMPUTE TL90 = (EXP(2*FISHERZL90) - 1)/(EXP(2*FISHERZL90) + 1).
COMPUTE TU90 = (EXP(2*FISHERZU90) - 1)/(EXP(2*FISHERZU90) + 1).
COMPUTE CRITICAL95 = ABS(IDF.NORMAL((1-.95)/2,0,1)).
COMPUTE FISHERZL95 = FISHERZ - 1.96*SEZ.
COMPUTE FISHERZU95 =  FISHERZ + 1.96*SEZ.
COMPUTE TL95 = (EXP(2*FISHERZL95) - 1)/(EXP(2*FISHERZL95) + 1).
COMPUTE TU95 = (EXP(2*FISHERZU95) - 1)/(EXP(2*FISHERZU95) + 1).
COMPUTE CRITICAL99 = ABS(IDF.NORMAL((1-.99)/2,0,1)).
COMPUTE FISHERZL99 = FISHERZ - 2.58*SEZ.
COMPUTE FISHERZU99 =  FISHERZ + 2.58*SEZ.
COMPUTE TL99 = (EXP(2*FISHERZL99) - 1)/(EXP(2*FISHERZL99) + 1).
COMPUTE TU99 = (EXP(2*FISHERZU99) - 1)/(EXP(2*FISHERZU99) + 1).
EXECUTE.
FORMAT N (F8.0).
FORMAT T (F9.2).
FORMAT FISHERZ TO TU99 (F9.3).
```

```
VARIABLE LABELS T 'Tau' /TU90 'Upper 90% CI'/TL90 'Lower 90% CI'/TU95
'Upper 95% CI'/TL95 'Lower 95% CI'/TU80 'Upper 80% CI'/TL80 'Lower 80%
CI'/TU99 'Upper 99% CI'/TL99 'Lower 99% CI'.
REPORT FORMAT=LIST AUTOMATIC ALIGN (CENTER)
  /VARIABLES= N T TL99 TL95 TL90 TL80 TU80 TU90 TU95 TU99
 /TITLE "Sample Size, Kendall's Tau, and 80%, 90%, 95%, 99% Confidence
Intervals".
```

Table 1. Sample size, Kendall's tau, and confidence intervals

N	Tau	L 99% CI	L 95% CI	L 90% CI	L 80% CI	U 80% CI	U 90% Ci	U 95% CI	U 99% CI
11	0.99	0.964	0.974	0.977	0.981	0.995	0.996	0.996	0.997
12	0.99	0.967	0.975	0.979	0.982	0.994	0.995	0.996	0.997
13	0.99	0.969	0.976	0.979	0.982	0.994	0.995	0.996	0.997
14	0.99	0.971	0.977	0.980	0.983	0.994	0.995	0.996	0.997
15	0.99	0.972	0.978	0.981	0.983	0.994	0.995	0.995	0.996
16	0.99	0.973	0.979	0.981	0.984	0.994	0.995	0.995	0.996
17	0.99	0.974	0.980	0.982	0.984	0.994	0.995	0.995	0.996
18	0.99	0.975	0.980	0.982	0.984	0.994	0.994	0.995	0.996
19	0.99	0.976	0.981	0.983	0.985	0.994	0.994	0.995	0.996
20	0.99	0.977	0.981	0.983	0.985	0.993	0.994	0.995	0.996
21	0.99	0.977	0.981	0.983	0.985	0.993	0.994	0.995	0.996
22	0.99	0.978	0.982	0.983	0.985	0.993	0.994	0.995	0.996
23	0.99	0.978	0.982	0.984	0.985	0.993	0.994	0.994	0.995
24	0.99	0.979	0.982	0.984	0.985	0.993	0.994	0.994	0.995
11	0.98	0.929	0.948	0.955	0.962	0.989	0.991	0.992	0.994
12	0.98	0.935	0.951	0.957	0.964	0.989	0.991	0.992	0.994
13	0.98	0.939	0.953	0.959	0.965	0.989	0.990	0.992	0.994
14	0.98	0.942	0.955	0.961	0.966	0.988	0.990	0.991	0.993
15	0.98	0.945	0.957	0.962	0.967	0.988	0.990	0.991	0.993
16	0.98	0.947	0.958	0.963	0.968	0.988	0.989	0.990	0.992
17	0.98	0.949	0.959	0.964	0.968	0.987	0.989	0.990	0.992
18	0.98	0.951	0.960	0.965	0.969	0.987	0.989	0.990	0.992
19	0.98	0.952	0.961	0.965	0.969	0.987	0.989	0.990	0.992
20	0.98	0.954	0.962	0.966	0.970	0.987	0.988	0.989	0.991
21	0.98	0.955	0.963	0.966	0.970	0.987	0.988	0.989	0.991
22	0.98	0.956	0.963	0.967	0.970	0.987	0.988	0.989	0.991
23	0.98	0.957	0.964	0.967	0.971	0.986	0.988	0.989	0.991
24	0.98	0.958	0.965	0.968	0.971	0.986	0.988	0.989	0.991
11	0.97	0.895	0.922	0.933	0.944	0.984	0.987	0.989	0.992
12	0.97	0.903	0.927	0.936	0.946	0.983	0.986	0.988	0.991
13	0.97	0.909	0.930	0.939	0.948	0.983	0.985	0.987	0.990
14	0.97	0.914	0.933	0.941	0.949	0.982	0.985	0.987	0.990
15	0.97	0.918	0.936	0.943	0.951	0.982	0.984	0.986	0.989
16	0.97	0.922	0.938	0.945	0.952	0.981	0.984	0.986	0.989
17	0.97	0.925	0.939	0.946	0.952	0.981	0.983	0.985	0.988

Table 1, continued.

N	Tau	L 99% CI	L 95% CI	L 90% CI	L 80% CI	U 80% CI	U 90% Ci	U 95% CI	U 99% CI
18	0.97	0.927	0.941	0.947	0.953	0.981	0.983	0.985	0.988
19	0.97	0.929	0.942	0.948	0.954	0.981	0.983	0.985	0.987
20	0.97	0.931	0.943	0.949	0.955	0.980	0.982	0.984	0.987
21	0.97	0.933	0.944	0.950	0.955	0.980	0.982	0.984	0.987
22	0.97	0.934	0.945	0.950	0.956	0.980	0.982	0.984	0.986
23	0.97	0.936	0.946	0.951	0.956	0.980	0.982	0.983	0.986
24	0.97	0.937	0.947	0.952	0.957	0.979	0.981	0.983	0.986
11	0.96	0.862	0.897	0.911	0.926	0.979	0.982	0.985	0.989
12	0.96	0.872	0.903	0.916	0.928	0.978	0.981	0.984	0.988
13	0.96	0.880	0.908	0.919	0.931	0.977	0.980	0.983	0.987
14	0.96	0.887	0.911	0.922	0.933	0.976	0.980	0.982	0.986
15	0.96	0.892	0.915	0.924	0.934	0.976	0.979	0.981	0.986
16	0.96	0.896	0.917	0.926	0.936	0.975	0.978	0.981	0.985
17	0.96	0.900	0.920	0.928	0.937	0.975	0.978	0.980	0.984
18	0.96	0.903	0.922	0.930	0.938	0.974	0.977	0.980	0.984
19	0.96	0.906	0.923	0.931	0.939	0.974	0.977	0.979	0.983
20	0.96	0.909	0.925	0.932	0.940	0.974	0.977	0.979	0.983
21	0.96	0.911	0.926	0.933	0.940	0.973	0.976	0.978	0.982
22	0.96	0.913	0.928	0.934	0.941	0.973	0.976	0.978	0.982
23	0.96	0.915	0.929	0.935	0.942	0.973	0.976	0.978	0.982
24	0.96	0.916	0.930	0.936	0.942	0.972	0.975	0.977	0.981
11	0.95	0.830	0.872	0.890	0.907	0.973	0.978	0.981	0.986
12	0.95	0.842	0.880	0.895	0.911	0.972	0.977	0.980	0.985
13	0.95	0.852	0.885	0.899	0.914	0.971	0.975	0.979	0.984
14	0.95	0.860	0.890	0.903	0.916	0.970	0.975	0.978	0.983
15	0.95	0.866	0.894	0.906	0.918	0.970	0.974	0.977	0.982
16	0.95	0.872	0.897	0.908	0.920	0.969	0.973	0.976	0.981
17	0.95	0.876	0.900	0.910	0.921	0.968	0.972	0.975	0.980
18	0.95	0.880	0.902	0.912	0.923	0.968	0.972	0.975	0.980
19	0.95	0.883	0.905	0.914	0.924	0.967	0.971	0.974	0.979
20	0.95	0.887	0.907	0.915	0.925	0.967	0.971	0.974	0.978
21	0.95	0.889	0.908	0.917	0.926	0.967	0.970	0.973	0.978
22	0.95	0.892	0.910	0.918	0.926	0.966	0.970	0.973	0.977
23	0.95	0.894	0.911	0.919	0.927	0.966	0.969	0.972	0.977
24	0.95	0.896	0.912	0.920	0.928	0.965	0.969	0.972	0.976
11	0.94	0.798	0.848	0.869	0.889	0.968	0.973	0.977	0.983
12	0.94	0.813	0.856	0.875	0.893	0.967	0.972	0.976	0.982
13	0.94	0.824	0.863	0.880	0.897	0.965	0.970	0.974	0.980
14	0.94	0.833	0.869	0.884	0.900	0.964	0.969	0.973	0.979
15	0.94	0.841	0.873	0.888	0.902	0.964	0.968	0.972	0.978
16	0.94	0.847	0.877	0.890	0.904	0.963	0.968	0.971	0.977
18	0.94	0.857	0.884	0.895	0.907	0.961	0.966	0.970	0.975
19	0.94	0.861	0.886	0.897	0.909	0.961	0.965	0.969	0.975
20	0.94	0.865	0.888	0.899	0.910	0.960	0.965	0.968	0.974
21	0.94	0.868	0.890	0.900	0.911	0.960	0.964	0.968	0.973

Table 1, continued.

N	Tau	L 99% CI	L 95% CI	L 90% CI	L 80% CI	U 80% CI	U 90% Ci	U 95% CI	U 99% CI
22	0.94	0.871	0.892	0.902	0.912	0.959	0.964	0.967	0.973
23	0.94	0.873	0.894	0.903	0.913	0.959	0.963	0.966	0.972
24	0.94	0.876	0.895	0.904	0.914	0.959	0.963	0.966	0.972
11	0.93	0.767	0.824	0.848	0.871	0.962	0.969	0.973	0.980
12	0.93	0.784	0.834	0.855	0.876	0.961	0.967	0.971	0.979
13	0.93	0.797	0.842	0.861	0.880	0.960	0.965	0.970	0.977
14	0.93	0.807	0.848	0.865	0.883	0.958	0.964	0.969	0.976
15	0.93	0.816	0.853	0.869	0.886	0.957	0.963	0.967	0.974
16	0.93	0.823	0.858	0.873	0.888	0.956	0.962	0.966	0.973
17	0.93	0.829	0.861	0.876	0.890	0.956	0.961	0.965	0.972
18	0.93	0.834	0.865	0.878	0.892	0.955	0.960	0.964	0.971
19	0.93	0.839	0.868	0.880	0.894	0.954	0.959	0.964	0.970
20	0.93	0.843	0.870	0.882	0.895	0.954	0.959	0.963	0.970
21	0.93	0.847	0.873	0.884	0.896	0.953	0.958	0.962	0.969
22	0.93	0.850	0.875	0.886	0.897	0.952	0.957	0.961	0.968
23	0.93	0.853	0.877	0.887	0.898	0.952	0.957	0.961	0.967
24	0.93	0.856	0.878	0.889	0.899	0.952	0.956	0.960	0.967
11	0.92	0.737	0.800	0.827	0.854	0.957	0.964	0.969	0.977
12	0.92	0.756	0.811	0.835	0.859	0.955	0.962	0.967	0.975
13	0.92	0.770	0.820	0.842	0.864	0.954	0.960	0.965	0.974
14	0.92	0.782	0.827	0.847	0.867	0.952	0.959	0.964	0.972
15	0.92	0.791	0.833	0.851	0.870	0.951	0.958	0.963	0.971
16	0.92	0.799	0.838	0.855	0.873	0.950	0.956	0.961	0.969
17	0.92	0.806	0.842	0.858	0.875	0.949	0.955	0.960	0.968
18	0.92	0.812	0.846	0.861	0.877	0.948	0.954	0.959	0.967
19	0.92	0.817	0.850	0.864	0.879	0.948	0.954	0.958	0.966
20	0.92	0.822	0.852	0.866	0.880	0.947	0.953	0.957	0.965
21	0.92	0.826	0.855	0.868	0.882	0.946	0.952	0.957	0.964
22	0.92	0.830	0.857	0.870	0.883	0.946	0.951	0.956	0.963
23	0.92	0.833	0.860	0.872	0.884	0.945	0.951	0.955	0.963
24	0.92	0.836	0.862	0.873	0.885	0.945	0.950	0.954	0.962
11	0.91	0.708	0.777	0.806	0.836	0.951	0.959	0.965	0.974
12	0.91	0.728	0.789	0.815	0.842	0.950	0.957	0.963	0.972
13	0.91	0.744	0.799	0.823	0.847	0.948	0.955	0.961	0.970
14	0.91	0.757	0.807	0.829	0.851	0.946	0.954	0.959	0.968
15	0.91	0.767	0.813	0.834	0.854	0.945	0.952	0.958	0.967
16	0.91	0.776	0.819	0.838	0.857	0.944	0.951	0.956	0.965
17	0.91	0.784	0.824	0.841	0.860	0.943	0.950	0.955	0.964
18	0.91	0.790	0.828	0.845	0.862	0.942	0.949	0.954	0.963
19	0.91	0.796	0.832	0.847	0.864	0.941	0.948	0.953	0.962
20	0.91	0.801	0.835	0.850	0.866	0.940	0.947	0.952	0.961
22	0.91	0.809	0.840	0.854	0.869	0.939	0.945	0.950	0.959
23	0.91	0.813	0.843	0.856	0.870	0.938	0.944	0.949	0.958
24	0.91	0.816	0.845	0.858	0.871	0.937	0.944	0.949	0.957
11	0.90	0.679	0.754	0.786	0.819	0.946	0.955	0.961	0.971

Table 1, continued.

N	Tau	L 99% CI	L 95% CI	L 90% CI	L 80% CI	U 80% CI	U 90% Ci	U 95% CI	U 99% CI
12	0.90	0.701	0.767	0.796	0.825	0.944	0.952	0.959	0.969
13	0.90	0.718	0.778	0.804	0.831	0.942	0.950	0.957	0.967
14	0.90	0.732	0.787	0.810	0.835	0.940	0.948	0.955	0.965
15	0.90	0.743	0.794	0.816	0.839	0.939	0.947	0.953	0.963
16	0.90	0.753	0.800	0.820	0.842	0.937	0.945	0.951	0.961
17	0.90	0.761	0.805	0.824	0.845	0.936	0.944	0.950	0.960
18	0.90	0.768	0.810	0.828	0.847	0.935	0.943	0.949	0.959
19	0.90	0.775	0.814	0.831	0.849	0.934	0.942	0.948	0.957
20	0.90	0.780	0.817	0.834	0.851	0.933	0.941	0.946	0.956
21	0.90	0.785	0.820	0.836	0.853	0.933	0.940	0.945	0.955
22	0.90	0.790	0.823	0.838	0.855	0.932	0.939	0.944	0.954
23	0.90	0.794	0.826	0.840	0.856	0.931	0.938	0.944	0.953
24	0.90	0.797	0.828	0.842	0.857	0.930	0.937	0.943	0.952
11	0.50	-0.095	0.060	0.137	0.226	0.701	0.744	0.778	0.832
12	0.50	-0.054	0.091	0.163	0.245	0.690	0.732	0.765	0.819
13	0.50	-0.019	0.117	0.185	0.261	0.681	0.722	0.754	0.807
14	0.50	0.010	0.139	0.203	0.275	0.673	0.713	0.744	0.796
15	0.50	0.035	0.157	0.218	0.286	0.667	0.705	0.735	0.787
16	0.50	0.057	0.174	0.231	0.296	0.660	0.698	0.727	0.779
17	0.50	0.076	0.188	0.243	0.305	0.655	0.692	0.720	0.771
18	0.50	0.093	0.200	0.253	0.312	0.650	0.686	0.714	0.764
19	0.50	0.109	0.212	0.262	0.319	0.646	0.681	0.708	0.757
20	0.50	0.122	0.222	0.271	0.325	0.642	0.676	0.703	0.751
21	0.50	0.135	0.231	0.278	0.331	0.638	0.671	0.698	0.746
22	0.50	0.146	0.239	0.285	0.336	0.634	0.667	0.694	0.740
23	0.50	0.157	0.247	0.291	0.341	0.631	0.663	0.689	0.735
24	0.50	0.166	0.254	0.297	0.345	0.628	0.660	0.685	0.731
11	0.49	-0.108	0.046	0.124	0.213	0.694	0.738	0.772	0.828
12	0.49	-0.067	0.078	0.150	0.233	0.683	0.726	0.759	0.814
13	0.49	-0.032	0.104	0.172	0.249	0.674	0.716	0.748	0.802
14	0.49	-0.003	0.126	0.190	0.262	0.666	0.706	0.738	0.791
15	0.49	0.022	0.144	0.205	0.274	0.659	0.698	0.729	0.782
16	0.49	0.044	0.161	0.219	0.284	0.653	0.691	0.721	0.773
17	0.49	0.063	0.175	0.230	0.293	0.647	0.685	0.714	0.765
18	0.49	0.080	0.188	0.241	0.300	0.642	0.679	0.708	0.758
19	0.49	0.095	0.199	0.250	0.307	0.638	0.673	0.702	0.752
20	0.49	0.109	0.209	0.258	0.314	0.634	0.668	0.696	0.745
21	0.49	0.122	0.218	0.266	0.319	0.630	0.664	0.691	0.740
22	0.49	0.133	0.227	0.273	0.324	0.626	0.660	0.687	0.734
23	0.49	0.144	0.234	0.279	0.329	0.623	0.656	0.682	0.729
24	0.49	0.153	0.241	0.285	0.334	0.620	0.652	0.678	0.725
12	0.48	-0.080	0.065	0.138	0.220	0.676	0.720	0.754	0.810
13	0.48	-0.045	0.091	0.159	0.236	0.667	0.709	0.742	0.797
14	0.48	-0.016	0.113	0.177	0.250	0.659	0.700	0.732	0.787
15	0.48	0.009	0.132	0.193	0.262	0.652	0.692	0.723	0.777

Table 1, continued.

N	Tau	L 99% CI	L 95% CI	L 90% CI	L 80% CI	U 80% CI	U 90% Ci	U 95% CI	U 99% CI
16	0.48	0.031	0.148	0.206	0.272	0.645	0.684	0.715	0.768
17	0.48	0.050	0.162	0.218	0.281	0.640	0.678	0.708	0.760
18	0.48	0.067	0.175	0.228	0.288	0.635	0.672	0.701	0.753
19	0.48	0.082	0.186	0.238	0.295	0.630	0.666	0.695	0.746
20	0.48	0.096	0.196	0.246	0.302	0.626	0.661	0.689	0.739
21	0.48	0.109	0.206	0.254	0.307	0.622	0.657	0.684	0.734
22	0.48	0.120	0.214	0.261	0.313	0.618	0.652	0.680	0.728
23	0.48	0.131	0.222	0.267	0.317	0.615	0.648	0.675	0.723
24	0.48	0.141	0.229	0.273	0.322	0.612	0.645	0.671	0.718
11	0.47	-0.134	0.020	0.099	0.188	0.680	0.726	0.762	0.819
12	0.47	-0.093	0.052	0.125	0.208	0.669	0.714	0.748	0.805
13	0.47	-0.058	0.078	0.147	0.224	0.660	0.703	0.736	0.793
14	0.47	-0.029	0.100	0.165	0.238	0.651	0.693	0.726	0.782
15	0.47	-0.004	0.119	0.180	0.250	0.644	0.685	0.717	0.772
16	0.47	0.018	0.135	0.194	0.260	0.638	0.677	0.708	0.763
17	0.47	0.037	0.150	0.205	0.269	0.632	0.671	0.701	0.754
18	0.47	0.054	0.162	0.216	0.277	0.627	0.664	0.694	0.747
19	0.47	0.070	0.174	0.225	0.284	0.622	0.659	0.688	0.740
20	0.47	0.083	0.184	0.234	0.290	0.618	0.654	0.683	0.734
21	0.47	0.096	0.193	0.241	0.296	0.614	0.649	0.677	0.728
22	0.47	0.108	0.202	0.248	0.301	0.610	0.645	0.673	0.722
23	0.47	0.118	0.210	0.255	0.306	0.607	0.641	0.668	0.717
24	0.47	0.128	0.217	0.261	0.310	0.604	0.637	0.664	0.712
11	0.46	-0.146	0.008	0.086	0.176	0.674	0.720	0.756	0.815
12	0.46	-0.105	0.039	0.112	0.196	0.662	0.707	0.742	0.801
13	0.46	-0.071	0.065	0.134	0.212	0.652	0.696	0.730	0.788
14	0.46	-0.042	0.087	0.152	0.226	0.644	0.686	0.720	0.777
15	0.46	-0.017	0.106	0.168	0.238	0.637	0.678	0.710	0.766
16	0.46	0.005	0.123	0.181	0.248	0.630	0.670	0.702	0.757
17	0.46	0.024	0.137	0.193	0.257	0.624	0.663	0.695	0.749
18	0.46	0.041	0.150	0.204	0.265	0.619	0.657	0.688	0.741
19	0.46	0.057	0.161	0.213	0.272	0.614	0.652	0.681	0.734
20	0.46	0.071	0.172	0.222	0.278	0.610	0.646	0.676	0.728
21	0.46	0.083	0.181	0.229	0.284	0.606	0.642	0.670	0.722
22	0.46	0.095	0.190	0.236	0.289	0.602	0.637	0.666	0.716
23	0.46	0.106	0.197	0.243	0.294	0.599	0.633	0.661	0.711
24	0.46	0.115	0.205	0.249	0.299	0.596	0.629	0.657	0.706
11	0.45	-0.159	-0.005	0.074	0.163	0.667	0.714	0.751	0.811
12	0.45	-0.118	0.027	0.100	0.183	0.655	0.701	0.737	0.796
13	0.45	-0.084	0.053	0.122	0.200	0.645	0.690	0.724	0.783
14	0.45	-0.055	0.075	0.140	0.214	0.637	0.680	0.714	0.772
16	0.45	-0.008	0.110	0.169	0.236	0.622	0.663	0.696	0.752
17	0.45	0.012	0.125	0.181	0.245	0.617	0.656	0.688	0.743
18	0.45	0.029	0.138	0.192	0.253	0.611	0.650	0.681	0.735
19	0.45	0.044	0.149	0.201	0.260	0.606	0.644	0.675	0.728

Table 1, continued.

N	Tau	L 99% CI	L 95% CI	L 90% CI	L 80% CI	U 80% CI	U 90% Ci	U 95% CI	U 99% CI
20	0.45	0.058	0.159	0.210	0.267	0.602	0.639	0.669	0.722
21	0.45	0.071	0.169	0.217	0.272	0.598	0.634	0.663	0.715
22	0.45	0.083	0.177	0.224	0.278	0.594	0.630	0.658	0.710
23	0.45	0.093	0.185	0.231	0.283	0.591	0.626	0.654	0.704
24	0.45	0.103	0.193	0.237	0.287	0.588	0.622	0.649	0.699
11	0.44	-0.171	-0.017	0.061	0.151	0.660	0.708	0.745	0.806
12	0.44	-0.130	0.014	0.088	0.171	0.648	0.695	0.731	0.791
13	0.44	-0.096	0.040	0.109	0.188	0.638	0.683	0.718	0.778
14	0.44	-0.067	0.062	0.128	0.202	0.629	0.673	0.707	0.766
15	0.44	-0.042	0.081	0.143	0.214	0.621	0.664	0.698	0.756
16	0.44	-0.020	0.098	0.157	0.224	0.615	0.656	0.689	0.746
17	0.44	-0.001	0.112	0.169	0.233	0.609	0.649	0.681	0.738
18	0.44	0.016	0.125	0.180	0.241	0.603	0.643	0.674	0.730
19	0.44	0.032	0.137	0.189	0.248	0.598	0.637	0.668	0.722
20	0.44	0.046	0.147	0.198	0.255	0.594	0.632	0.662	0.716
21	0.44	0.059	0.157	0.206	0.261	0.590	0.627	0.656	0.709
22	0.44	0.070	0.165	0.213	0.266	0.586	0.622	0.651	0.704
23	0.44	0.081	0.173	0.219	0.271	0.583	0.618	0.647	0.698
24	0.44	0.091	0.181	0.225	0.276	0.579	0.614	0.642	0.693
11	0.43	-0.183	-0.030	0.049	0.139	0.653	0.702	0.740	0.802
12	0.43	-0.142	0.002	0.075	0.159	0.641	0.688	0.725	0.787
13	0.43	-0.108	0.028	0.097	0.176	0.630	0.676	0.712	0.773
14	0.43	-0.079	0.050	0.115	0.190	0.622	0.666	0.701	0.761
15	0.43	-0.054	0.069	0.131	0.202	0.614	0.657	0.691	0.751
16	0.43	-0.032	0.086	0.145	0.212	0.607	0.649	0.683	0.741
17	0.43	-0.013	0.100	0.157	0.221	0.601	0.642	0.675	0.732
18	0.43	0.004	0.113	0.168	0.230	0.595	0.635	0.667	0.724
19	0.43	0.020	0.125	0.177	0.237	0.590	0.630	0.661	0.716
20	0.43	0.034	0.135	0.186	0.243	0.586	0.624	0.655	0.710
21	0.43	0.046	0.145	0.194	0.249	0.582	0.619	0.649	0.703
22	0.43	0.058	0.153	0.201	0.255	0.578	0.615	0.644	0.697
23	0.43	0.069	0.161	0.207	0.260	0.574	0.610	0.639	0.692
24	0.43	0.078	0.169	0.213	0.264	0.571	0.606	0.635	0.686
11	0.42	-0.194	-0.042	0.037	0.127	0.645	0.696	0.734	0.798
12	0.42	-0.154	-0.010	0.063	0.147	0.633	0.682	0.719	0.782
13	0.42	-0.120	0.016	0.085	0.164	0.623	0.670	0.706	0.768
14	0.42	-0.091	0.038	0.103	0.178	0.614	0.659	0.695	0.756
15	0.42	-0.066	0.057	0.119	0.190	0.606	0.650	0.685	0.745
16	0.42	-0.045	0.074	0.133	0.201	0.599	0.642	0.676	0.735
17	0.42	-0.025	0.088	0.145	0.210	0.593	0.635	0.668	0.726
18	0.42	-0.008	0.101	0.156	0.218	0.587	0.628	0.661	0.718
20	0.42	0.021	0.123	0.174	0.232	0.578	0.617	0.648	0.703
21	0.42	0.034	0.133	0.182	0.238	0.574	0.612	0.642	0.697
22	0.42	0.046	0.141	0.189	0.243	0.570	0.607	0.637	0.691
23	0.42	0.056	0.149	0.196	0.248	0.566	0.603	0.632	0.685

Table 1, continued.

N	Tau	L 99% CI	L 95% CI	L 90% CI	L 80% CI	U 80% CI	U 90% Ci	U 95% CI	U 99% CI
24	0.42	0.066	0.157	0.202	0.253	0.563	0.599	0.628	0.680
11	0.41	-0.206	-0.054	0.025	0.115	0.638	0.689	0.728	0.793
12	0.41	-0.166	-0.022	0.051	0.136	0.626	0.675	0.713	0.777
13	0.41	-0.132	0.004	0.073	0.152	0.615	0.663	0.700	0.763
14	0.41	-0.103	0.026	0.091	0.166	0.606	0.652	0.689	0.751
15	0.41	-0.078	0.045	0.107	0.179	0.598	0.643	0.678	0.740
16	0.41	-0.057	0.062	0.121	0.189	0.591	0.635	0.669	0.730
17	0.41	-0.037	0.076	0.133	0.198	0.585	0.627	0.661	0.720
18	0.41	-0.020	0.089	0.144	0.206	0.580	0.621	0.654	0.712
19	0.41	-0.005	0.101	0.154	0.214	0.574	0.615	0.647	0.704
20	0.41	0.009	0.111	0.162	0.220	0.570	0.609	0.641	0.697
21	0.41	0.022	0.121	0.170	0.226	0.565	0.604	0.635	0.691
22	0.41	0.034	0.129	0.177	0.232	0.562	0.599	0.630	0.685
23	0.41	0.044	0.137	0.184	0.237	0.558	0.595	0.625	0.679
24	0.41	0.054	0.145	0.190	0.242	0.554	0.591	0.620	0.673
11	0.40	-0.217	-0.066	0.013	0.103	0.631	0.683	0.723	0.789
12	0.40	-0.177	-0.034	0.039	0.124	0.619	0.669	0.707	0.773
13	0.40	-0.144	-0.008	0.061	0.141	0.608	0.656	0.694	0.758
14	0.40	-0.115	0.014	0.080	0.155	0.599	0.645	0.682	0.746
15	0.40	-0.090	0.033	0.095	0.167	0.591	0.636	0.672	0.734
16	0.40	-0.069	0.050	0.109	0.177	0.584	0.628	0.663	0.724
17	0.40	-0.049	0.064	0.121	0.187	0.577	0.620	0.654	0.715
18	0.40	-0.032	0.077	0.132	0.195	0.572	0.613	0.647	0.706
19	0.40	-0.017	0.089	0.142	0.202	0.566	0.607	0.640	0.698
20	0.40	-0.003	0.099	0.151	0.209	0.562	0.602	0.634	0.691
21	0.40	0.010	0.109	0.159	0.215	0.557	0.596	0.628	0.684
22	0.40	0.022	0.118	0.166	0.221	0.553	0.591	0.622	0.678
23	0.40	0.032	0.126	0.172	0.226	0.550	0.587	0.617	0.672
24	0.40	0.042	0.133	0.179	0.230	0.546	0.583	0.613	0.667
11	-0.10	-0.632	-0.530	-0.471	-0.397	0.216	0.301	0.371	0.496
12	-0.10	-0.606	-0.507	-0.450	-0.380	0.196	0.277	0.343	0.464
13	-0.10	-0.584	-0.487	-0.432	-0.365	0.180	0.256	0.320	0.437
14	-0.10	-0.565	-0.470	-0.417	-0.352	0.166	0.239	0.300	0.413
15	-0.10	-0.547	-0.455	-0.404	-0.341	0.154	0.224	0.282	0.392
16	-0.10	-0.532	-0.442	-0.392	-0.332	0.143	0.210	0.267	0.373
17	-0.10	-0.518	-0.430	-0.382	-0.323	0.134	0.199	0.253	0.356
18	-0.10	-0.505	-0.419	-0.372	-0.315	0.125	0.188	0.241	0.341
19	-0.10	-0.494	-0.409	-0.364	-0.308	0.118	0.179	0.230	0.328
20	-0.10	-0.483	-0.401	-0.356	-0.302	0.111	0.170	0.220	0.315
21	-0.10	-0.473	-0.392	-0.349	-0.296	0.105	0.162	0.211	0.303
22	-0.10	-0.464	-0.385	-0.342	-0.291	0.099	0.155	0.202	0.293
24	-0.10	-0.448	-0.371	-0.331	-0.282	0.089	0.142	0.187	0.274
11	-0.11	-0.638	-0.537	-0.479	-0.406	0.206	0.292	0.362	0.489
12	-0.11	-0.613	-0.514	-0.458	-0.388	0.187	0.267	0.334	0.456
13	-0.11	-0.591	-0.495	-0.441	-0.374	0.170	0.247	0.311	0.429

Table 1, continued.

N	Tau	L 99% CI	L 95% CI	L 90% CI	L 80% CI	U 80% CI	U 90% Ci	U 95% CI	U 99% CI
14	-0.11	-0.572	-0.478	-0.425	-0.361	0.156	0.229	0.291	0.404
15	-0.11	-0.554	-0.463	-0.412	-0.350	0.144	0.214	0.273	0.383
16	-0.11	-0.539	-0.450	-0.401	-0.341	0.133	0.201	0.258	0.364
17	-0.11	-0.525	-0.438	-0.390	-0.332	0.124	0.189	0.244	0.347
18	-0.11	-0.513	-0.427	-0.381	-0.324	0.115	0.178	0.232	0.332
19	-0.11	-0.501	-0.418	-0.372	-0.318	0.108	0.169	0.220	0.318
20	-0.11	-0.491	-0.409	-0.365	-0.311	0.101	0.160	0.210	0.306
21	-0.11	-0.481	-0.401	-0.358	-0.306	0.094	0.152	0.201	0.294
22	-0.11	-0.472	-0.393	-0.351	-0.300	0.089	0.145	0.193	0.284
23	-0.11	-0.463	-0.387	-0.345	-0.295	0.083	0.138	0.185	0.274
24	-0.11	-0.456	-0.380	-0.340	-0.291	0.079	0.132	0.177	0.264
11	-0.12	-0.644	-0.544	-0.487	-0.414	0.197	0.283	0.353	0.481
12	-0.12	-0.619	-0.522	-0.466	-0.397	0.177	0.258	0.325	0.448
13	-0.12	-0.597	-0.502	-0.449	-0.382	0.160	0.237	0.302	0.420
14	-0.12	-0.578	-0.486	-0.434	-0.370	0.146	0.220	0.281	0.396
15	-0.12	-0.561	-0.471	-0.421	-0.359	0.134	0.204	0.264	0.375
16	-0.12	-0.546	-0.458	-0.409	-0.349	0.123	0.191	0.248	0.356
17	-0.12	-0.532	-0.446	-0.399	-0.341	0.114	0.179	0.234	0.339
18	-0.12	-0.520	-0.436	-0.390	-0.333	0.105	0.168	0.222	0.323
19	-0.12	-0.509	-0.426	-0.381	-0.327	0.098	0.159	0.211	0.309
20	-0.12	-0.498	-0.417	-0.373	-0.320	0.091	0.150	0.201	0.297
21	-0.12	-0.489	-0.409	-0.366	-0.315	0.084	0.142	0.191	0.285
22	-0.12	-0.480	-0.402	-0.360	-0.310	0.079	0.135	0.183	0.274
23	-0.12	-0.471	-0.395	-0.354	-0.305	0.073	0.128	0.175	0.264
24	-0.12	-0.464	-0.389	-0.349	-0.300	0.069	0.122	0.168	0.255
11	-0.13	-0.650	-0.551	-0.494	-0.422	0.187	0.273	0.344	0.473
12	-0.13	-0.625	-0.529	-0.474	-0.405	0.167	0.248	0.316	0.440
13	-0.13	-0.604	-0.510	-0.457	-0.391	0.150	0.228	0.292	0.412
14	-0.13	-0.585	-0.493	-0.442	-0.379	0.136	0.210	0.272	0.387
15	-0.13	-0.568	-0.479	-0.429	-0.368	0.124	0.195	0.254	0.366
16	-0.13	-0.553	-0.466	-0.417	-0.358	0.113	0.181	0.239	0.347
17	-0.13	-0.540	-0.454	-0.407	-0.350	0.104	0.169	0.225	0.330
18	-0.13	-0.527	-0.444	-0.398	-0.342	0.095	0.159	0.212	0.314
19	-0.13	-0.516	-0.434	-0.390	-0.336	0.088	0.149	0.201	0.300
20	-0.13	-0.506	-0.426	-0.382	-0.330	0.081	0.140	0.191	0.287
21	-0.13	-0.496	-0.418	-0.375	-0.324	0.074	0.132	0.181	0.276
22	-0.13	-0.487	-0.410	-0.369	-0.319	0.069	0.125	0.173	0.265
23	-0.13	-0.479	-0.404	-0.363	-0.314	0.063	0.118	0.165	0.255
24	-0.13	-0.472	-0.397	-0.357	-0.309	0.058	0.112	0.158	0.246
11	-0.14	-0.656	-0.558	-0.502	-0.431	0.177	0.264	0.335	0.465
12	-0.14	-0.632	-0.536	-0.482	-0.414	0.157	0.239	0.307	0.432
14	-0.14	-0.592	-0.501	-0.450	-0.387	0.126	0.200	0.263	0.379
15	-0.14	-0.575	-0.487	-0.437	-0.377	0.114	0.185	0.245	0.357
16	-0.14	-0.560	-0.474	-0.426	-0.367	0.103	0.171	0.229	0.338
17	-0.14	-0.547	-0.462	-0.416	-0.359	0.093	0.159	0.215	0.320

Table 1, continued.

N	Tau	L 99% CI	L 95% CI	L 90% CI	L 80% CI	U 80% CI	U 90% Ci	U 95% CI	U 99% CI
18	-0.14	-0.535	-0.452	-0.407	-0.351	0.085	0.149	0.203	0.305
19	-0.14	-0.524	-0.443	-0.398	-0.345	0.077	0.139	0.191	0.291
20	-0.14	-0.513	-0.434	-0.391	-0.339	0.070	0.130	0.181	0.278
21	-0.14	-0.504	-0.426	-0.384	-0.333	0.064	0.122	0.172	0.266
22	-0.14	-0.495	-0.419	-0.378	-0.328	0.058	0.115	0.163	0.255
23	-0.14	-0.487	-0.412	-0.372	-0.323	0.053	0.108	0.155	0.245
24	-0.14	-0.479	-0.406	-0.366	-0.319	0.048	0.102	0.148	0.236
11	-0.15	-0.662	-0.565	-0.510	-0.439	0.167	0.254	0.326	0.457
12	-0.15	-0.638	-0.544	-0.490	-0.422	0.147	0.229	0.298	0.423
13	-0.15	-0.617	-0.525	-0.473	-0.408	0.130	0.208	0.274	0.395
14	-0.15	-0.598	-0.509	-0.458	-0.396	0.116	0.190	0.253	0.370
15	-0.15	-0.582	-0.494	-0.445	-0.385	0.104	0.175	0.235	0.348
16	-0.15	-0.567	-0.482	-0.434	-0.376	0.093	0.161	0.219	0.329
17	-0.15	-0.554	-0.470	-0.424	-0.368	0.083	0.149	0.205	0.311
18	-0.15	-0.542	-0.460	-0.415	-0.360	0.075	0.139	0.193	0.296
19	-0.15	-0.531	-0.451	-0.407	-0.354	0.067	0.129	0.181	0.281
20	-0.15	-0.521	-0.442	-0.399	-0.348	0.060	0.120	0.171	0.268
21	-0.15	-0.512	-0.434	-0.393	-0.342	0.054	0.112	0.162	0.257
22	-0.15	-0.503	-0.427	-0.386	-0.337	0.048	0.105	0.153	0.246
23	-0.15	-0.495	-0.421	-0.380	-0.332	0.043	0.098	0.145	0.236
24	-0.15	-0.487	-0.414	-0.375	-0.328	0.038	0.092	0.138	0.226
11	-0.16	-0.667	-0.572	-0.517	-0.447	0.157	0.245	0.317	0.449
12	-0.16	-0.644	-0.551	-0.497	-0.431	0.137	0.219	0.288	0.415
13	-0.16	-0.623	-0.532	-0.481	-0.416	0.120	0.198	0.264	0.386
14	-0.16	-0.605	-0.516	-0.466	-0.404	0.106	0.180	0.243	0.361
15	-0.16	-0.589	-0.502	-0.454	-0.394	0.093	0.165	0.225	0.339
16	-0.16	-0.574	-0.490	-0.442	-0.385	0.083	0.151	0.209	0.319
17	-0.16	-0.561	-0.478	-0.433	-0.377	0.073	0.139	0.195	0.302
18	-0.16	-0.549	-0.468	-0.424	-0.369	0.065	0.129	0.183	0.286
19	-0.16	-0.538	-0.459	-0.415	-0.363	0.057	0.119	0.171	0.272
20	-0.16	-0.528	-0.450	-0.408	-0.357	0.050	0.110	0.161	0.259
21	-0.16	-0.519	-0.443	-0.401	-0.351	0.044	0.102	0.152	0.247
22	-0.16	-0.510	-0.436	-0.395	-0.346	0.038	0.095	0.143	0.236
23	-0.16	-0.503	-0.429	-0.389	-0.341	0.033	0.088	0.135	0.226
24	-0.16	-0.495	-0.423	-0.384	-0.337	0.028	0.082	0.128	0.217
11	-0.17	-0.673	-0.579	-0.525	-0.455	0.147	0.235	0.308	0.441
12	-0.17	-0.650	-0.558	-0.505	-0.439	0.127	0.210	0.279	0.406
13	-0.17	-0.629	-0.540	-0.489	-0.425	0.110	0.189	0.255	0.377
14	-0.17	-0.611	-0.524	-0.474	-0.413	0.096	0.171	0.234	0.352
15	-0.17	-0.595	-0.510	-0.462	-0.403	0.083	0.155	0.216	0.330
16	-0.17	-0.581	-0.497	-0.451	-0.393	0.072	0.141	0.200	0.310
18	-0.17	-0.556	-0.476	-0.432	-0.378	0.054	0.118	0.173	0.277
19	-0.17	-0.546	-0.467	-0.424	-0.371	0.047	0.109	0.161	0.262
20	-0.17	-0.536	-0.459	-0.417	-0.365	0.040	0.100	0.151	0.249
21	-0.17	-0.527	-0.451	-0.410	-0.360	0.034	0.092	0.142	0.237

Table 1, continued.

N	Tau	L 99% CI	L 95% CI	L 90% CI	L 80% CI	U 80% CI	U 90% Ci	U 95% CI	U 99% CI
22	-0.17	-0.518	-0.444	-0.404	-0.355	0.028	0.084	0.133	0.226
23	-0.17	-0.510	-0.437	-0.398	-0.350	0.022	0.078	0.125	0.216
24	-0.17	-0.503	-0.431	-0.393	-0.346	0.018	0.071	0.118	0.207
11	-0.18	-0.679	-0.586	-0.532	-0.464	0.137	0.225	0.298	0.432
12	-0.18	-0.656	-0.565	-0.513	-0.447	0.117	0.200	0.269	0.398
13	-0.18	-0.635	-0.547	-0.496	-0.433	0.100	0.179	0.245	0.368
14	-0.18	-0.618	-0.531	-0.482	-0.422	0.085	0.160	0.224	0.343
15	-0.18	-0.602	-0.517	-0.470	-0.411	0.073	0.145	0.206	0.321
16	-0.18	-0.588	-0.505	-0.459	-0.402	0.062	0.131	0.190	0.301
17	-0.18	-0.575	-0.494	-0.449	-0.394	0.053	0.119	0.176	0.283
18	-0.18	-0.563	-0.484	-0.440	-0.387	0.044	0.108	0.163	0.267
19	-0.18	-0.553	-0.475	-0.432	-0.380	0.036	0.098	0.151	0.253
20	-0.18	-0.543	-0.467	-0.425	-0.374	0.030	0.090	0.141	0.240
21	-0.18	-0.534	-0.459	-0.418	-0.369	0.023	0.082	0.131	0.228
22	-0.18	-0.526	-0.452	-0.412	-0.364	0.017	0.074	0.123	0.217
23	-0.18	-0.518	-0.446	-0.407	-0.359	0.012	0.067	0.115	0.206
24	-0.18	-0.510	-0.440	-0.401	-0.355	0.007	0.061	0.107	0.197
11	-0.19	-0.684	-0.593	-0.539	-0.472	0.127	0.215	0.289	0.424
12	-0.19	-0.661	-0.572	-0.520	-0.455	0.106	0.190	0.260	0.389
13	-0.19	-0.642	-0.554	-0.504	-0.442	0.089	0.169	0.235	0.359
14	-0.19	-0.624	-0.539	-0.490	-0.430	0.075	0.150	0.214	0.334
15	-0.19	-0.609	-0.525	-0.478	-0.420	0.063	0.135	0.196	0.311
16	-0.19	-0.595	-0.513	-0.467	-0.411	0.052	0.121	0.180	0.291
17	-0.19	-0.582	-0.502	-0.457	-0.403	0.042	0.109	0.165	0.274
18	-0.19	-0.570	-0.492	-0.449	-0.396	0.034	0.098	0.153	0.258
19	-0.19	-0.560	-0.483	-0.441	-0.389	0.026	0.088	0.141	0.243
20	-0.19	-0.550	-0.475	-0.433	-0.383	0.019	0.079	0.131	0.230
21	-0.19	-0.541	-0.467	-0.427	-0.378	0.013	0.071	0.121	0.218
22	-0.19	-0.533	-0.460	-0.421	-0.373	0.007	0.064	0.113	0.207
23	-0.19	-0.525	-0.454	-0.415	-0.368	0.002	0.057	0.105	0.196
24	-0.19	-0.518	-0.448	-0.410	-0.364	-0.003	0.051	0.097	0.187
11	-0.20	-0.690	-0.600	-0.547	-0.480	0.117	0.205	0.279	0.415
12	-0.20	-0.667	-0.579	-0.528	-0.464	0.096	0.180	0.250	0.380
13	-0.20	-0.648	-0.561	-0.512	-0.450	0.079	0.158	0.225	0.350
14	-0.20	-0.630	-0.546	-0.498	-0.438	0.065	0.140	0.204	0.324
15	-0.20	-0.615	-0.532	-0.486	-0.428	0.052	0.124	0.186	0.302
16	-0.20	-0.601	-0.520	-0.475	-0.419	0.042	0.111	0.170	0.282
17	-0.20	-0.589	-0.510	-0.466	-0.411	0.032	0.099	0.155	0.264
18	-0.20	-0.577	-0.500	-0.457	-0.404	0.023	0.088	0.143	0.248
19	-0.20	-0.567	-0.491	-0.449	-0.398	0.016	0.078	0.131	0.233
20	-0.20	-0.557	-0.483	-0.442	-0.392	0.009	0.069	0.121	0.220
22	-0.20	-0.540	-0.468	-0.429	-0.382	-0.003	0.054	0.102	0.197
23	-0.20	-0.533	-0.462	-0.424	-0.377	-0.009	0.047	0.094	0.186
24	-0.20	-0.526	-0.456	-0.419	-0.373	-0.014	0.040	0.087	0.177

References

American Psychological Association. (2010). *Publication manual of the American Psychological Association* (6th ed.). Washington, DC: American Psychological Association.

Bonett, D. G., & Wright, T. A. (2000). Sample size requirements for estimating Pearson, Kendall and Spearman correlations. *Psychometrika, 65*(1), 23-28. doi: 10.1007/BF02294183

Cohen, J. (1990). Things I have learned (so far). *American Psychologist, 45*(1), 1304-1312. doi: 10.1037/0003-066X.45.12.1304

Cooper, H., & Hedges, L. V. (Eds.). (1994). *The handbook of research synthesis*. New York, NY: Russell Sage Foundation.

Fieller, E. C., Hartley, H. O., & Pearson, E. S. (1957). Tests for rank correlation coefficients. Biometrika, 44(3/4), 470-481. doi: 10.2307/2332878

Fisher, R. A. (1925). *Statistical methods for research workers*. London: Hafner Press.

Gilpin, A. R. (1993). Table for conversion of Kendall's tau to Spearman's rho within the context of measures of magnitude of effect for meta-analysis. *Educational and Psychological Measurement, 53*(1), 87-92. doi: 10.1177/0013164493053001007

Helsel, D. R., & Hirsch, R. M. (1995). *Statistical methods in water resources*. Amsterdam: Elsevier Science.

Kendall, M. G. (1949). Rank and product-moment correlation. *Biometrika, 36*(1/2), 177-193. doi: 10.2307/2332540

Levin, J. R., & Robinson, D. H. (2003). The trouble with interpreting statistically nonsignificant effect sizes in single-study investigations. *Journal of Modern Applied Statistical Methods, 2*(1), 231-236. Retrieved from http://digitalcommons.wayne.edu/jmasm/vol2/iss1/23/

Long, J. D., & Cliff, N. (1997). Confidence intervals for Kendall's tau. *British Journal of Mathematical and Statistical Psychology, 50*(1), 31-41. doi: 10.1111/j.2044-8317.1997.tb01100.x

Rupinski, M. T., & Dunlap, W. P. (1996). Approximating Pearson product-moment correlations from Kendall's tau and Spearman's rho. *Educational and Psychological Measurement, 56*(3), 419-429. doi: 10.1177/0013164496056003004

Tukey, J. W. (1960). Conclusions vs decisions. *Technometrics, 2*(4), 423-433. doi: 10.1080/00401706.1960.10489909

Walker, D. A. (2015). *Confidence intervals for Kendall's tau with small samples*. [Computer program]. DeKalb, IL: Author.